Hossein Mir

+98 937-391-9441
hossein.mir.amt@gmail.com
hossein.mir@amt.mui.ac.ir
LinkedIn
Google Scholar
Research Gate

Education

-Master's Degree, Bio-Electrics and Biomedical Engineering (2020-2024)
Department of Bio-Electrics, School of Advanced Technologies in Medicine, Isfahan University of Medical Sciences, Isfahan, Isfahan/Iran
Thesis title: Identification of Circular Patterns in Capsule Endoscopy Bubble Frames Using Fast Circlet Transform
Thesis grade: 4/4 (19.82/20 Iranian scale)
GPA: 3.88/4 (18.25/20 Iranian scale)

-Bachelor's Degree, Biomedical Engineering and Bio-Electrics (2016-2020)
Meybod University, Meybod, Yazd/Iran
Thesis title: Investigation of Deep Convolutional Neural Networks Application in the Classification of White Blood Cells
Thesis grade: 4/4 (20/20 Iranian scale)
GPA: 3.48/4 (17.03/20 Iranian scale)

Research Experience

Research Assistant (2020- Present)
Image Processing Research Group/ National Artificial Intelligence Steering Council/ Medical Image and Signal Processing Center*, Isfahan University of Medical Sciences, Isfahan, Isfahan/*Iran

- Multiple Sclerosis Lesion Segmentation in MRI
- Development of a deep learning–based software framework for segmentation of Multiple Sclerosis lesions in MRI images
- Contribution to model design, implementation, and evaluation
- Co-authored peer-reviewed research paper

- Breast Microcalcification Segmentation
- Development of a novel wavelet-based analysis method for breast microcalcification segmentation
- Focus on multi-scale representation and lesion enhancement
- Co-authored peer-reviewed research paper

- Interpretable Ellipse Detection
- Development of an interpretable, rule-based ellipse detection algorithm via internal circular reasoning
- Emphasis on theoretical formulation and mathematical modeling
- First-authored peer-reviewed research paper

- Fast Circlet Transform – Circle Detection
- Development of a New Dynamic Circle Detection Algorithm for the Fast Circlet Transform
- Theoretical analysis of coefficient behavior and geometric consistency
- First-authored peer-reviewed research paper

Capsule Endoscopy Research Group/ National Artificial Intelligence Steering Council/ Medical Image and Signal Processing Center, Isfahan University of Medical Sciences, Isfahan, Isfahan/Iran

- Development of a new wavelet-based algorithm for high-pass filtering of reflective components in capsule endoscopy bubble frames
- Data preparation and preprocessing for downstream analysis
- Co-authored peer-reviewed research paper

Thesis (2020 - 2024)
- Capsule Endoscopy Research Group/ National Artificial Intelligence Steering Council/ Medical Image and Signal Processing Center*, Isfahan University of Medical Sciences, Isfahan, Isfahan/Iran*
- Circular Pattern Quantification in Capsule Endoscopy
- Development of a novel foam-based metric for quantifying circular patterns in capsule endoscopy bubble frames
- Utilization of the Fast Circlet Transform for shape analysis
- Theoretical and Mathematical Analysis
- First-authored research paper

Publications

- **Hossein Mir,** Alireza Mehridehnavi, "*Interpretable Ellipse Detection via Internal Circular Reasoning: A Rule-Based Framework for Geometric Shape Understanding*" (2025), **Image and Vision Computing**, *Under review*
- **Hossein Mir,** Alireza Mehridehnavi, "*A Novel Approach for Fast Circlet Transform: Dynamic Analysis of Coefficients for Circular Shapes Quantification*" (2024), **Pattern Recognition**, *Under review*, Peer review status
- **Hossein Mir**, Vahid Sadeghi, Alireza Vard, Alireza Mehridehnavi, "*Identification of Circular Patterns in Capsule Endoscopy Bubble Frames*" (2024), Journal of Medical Signals and Sensors, DOI**:** 10.4103/jmss.jmss_50_23
- Aref Zarei-Zad, **Hossein Mir,** Vahid Sadeghi, Seyed-Amir Tabatabaei, Alireza Mehridehnavi, "*Enhanced CAD for Early Breast Cancer Detection: Microcalcification Segmentation via Multi-Wavelet Fusion and Novel Lesion-Wise Evaluation Metrics*" (2025), The Breast Journal, *Under review*
- Vahid Sadeghi, Alireza Vard, Mohsen Sharifi, **Hossein Mir,** Alireza Mehridehnavi, "*Segmentation and region quantification of bubbles in small bowel capsule endoscopy images using wavelet transform*" (2024), **Informatics in Medicine Unlocked**, https://doi.org/10.1016/j.imu.2023.101364
- **Hossein Mir**, Zohre Ansari, Mohammad Amin Majdian, "*White Blood Cell Image Classification by Pre-Trained Deep Convolutional Neural Networks*", "28th National and 6th International Iranian Conference on Biomedical Engineering, Sharif University of Technology, Tehran, Iran (2021).

Conference Presentations

- **Hossein Mir**, "*White Blood Cell Image Classification by Pre-Trained Deep Convolutional Neural Networks*", 28th National and 6th International Iranian Conference on Biomedical Engineering, Sharif University of Technology, Tehran, Iran (2021).

Teaching Experience

Laboratory Instructor / Teaching Assistant – Graduate Electronics Laboratory *(2025-Present)*
Department of Bio-Electrics, School of Advanced Technologies in Medicine, Isfahan University of Medical Sciences
- Instruction and supervision of M.Sc.-level electronics laboratory experiments
- Circuit implementation, output signal measurement, and experimental analysis
- Hands-on training in the use of electronic measurement instruments
- Technical mentoring of graduate students in experimental troubleshooting

Research Interests

- Image Processing, Biomedical Image Processing
- Pattern Recognition
- Data Science

- Machine Learning
- Deep Learning

Skills

- Programming: Python, MATLAB
- Software & Tools: Pycharm, Qt Designer, Spider, MATLAB, ImageJ, ITK Snap, Inno
- Technical: Image Processing, Machine Learning, Pattern Recognition, Computer Vision, PyQt5, Electronic circuit assembly and measurement, oscilloscope and function generator operation, experimental troubleshooting
- Teaching: Graduate-level laboratory instruction, student supervision, laboratory assessment
- Analytical: Wavelet Coefficient Analysis, Shape Detection, Theoretical and Mathematical Modeling
- Laboratory Skills: Data Annotation

Honors & Awards

- Ranked 12th nationwide in the National Universities Entrance Exam, Ministry of Health and Medical Education (2020)
- Awarded Outstanding Graduate, School of Advanced Technologies in Medicine (2020-2023)
- Full Tuition Waiver Scholarship from Isfahan University of Medical Sciences, Graduate (2020)
- Received top 10 outstanding undergraduate students, awarded By faculty of engineering, Meybod University (2019)
- Full Tuition Waiver Scholarship from Meybod University, Undergraduate, (2016)

Professional Experience

- Governance Council for Artificial Intelligence, Isfahan University of Medical Sciences, Isfahan province, Isfahan, Iran (2025)
- Medical Image and Signal Processing Research Center, Isfahan University of Medical Sciences, Isfahan province, Isfahan, Iran (2025)
-Apprenticeship at Bu-Ali hospital, Zahedan, Sistan and Baluchestan/Iran (2022)

Test Scores

- IELTS:
Overall band score: 7.5
Listening: 8.5
Reading: 7.5
Speaking: 7
Writing: 6.5
- GRE General, Planning to take

Accomplishments

- Received membership in the brilliant talent department at the Isfahan University of Medical Sciences, Isfahan, Isfahan/Iran (2021- 2025)

References

- Hossein Rabbani, Professor of Biomedical Engineering and Bio-Electrics, School of Advanced Technologies in Medicine, Isfahan University of Medical Sciences, Isfahan, Isfahan/Iran**,** **(**h_rabbani@med.mui.ac.ir**)**
- Alireza Mehri Dehnavi, Professor of Biomedical Engineering and Bio-Electrics, School of Advanced Technologies in Medicine, Isfahan University of Medical Sciences, Isfahan, Isfahan/Iran**,** **(**Mehri@med.mui.ac.ir**)**
- Saeid Kermani**,** Professor of Biomedical Engineering and Bio-Electrics, School of Advanced Technologies in Medicine, Isfahan University of Medical Sciences, Isfahan, Isfahan/Iran**,** **(**kermani@med.mui.ac.ir**)**
- Alireza Vard, Associate Professor of Biomedical Engineering and Bio-Electrics, School of Advanced Technologies in Medicine, Isfahan University of Medical Sciences, Isfahan, Isfahan/Iran**,** **(**vard@amt.mui.ac.ir**)**

- Mohammadreza Sehhati, Assistant Professor of Biomedical Engineering, School of Advanced Technologies in Medicine, Isfahan University of Medical Sciences, Isfahan, Isfahan/Iran**, (**mr.sehhati@amt.mui.ac.ir**)**
- Zohreh Ansari, Assistant Professor of BioMedical Engineering, Faculty of Engineering, Meybod University, Meybod, Yazd/Iran, (z_ansari@meybod.ac.ir)